

EFFECT OF PHYSICAL FORM OF DIETARY CARBOHYDRATE IN DETERMINING
POSTPRANDIAL GLUCOSE AND INSULIN RESPONSES IN DIABETICS

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In view of the low prevalence of diabetes in populations consuming diets high in unrefined carbohydrate, it is perhaps paradoxical that the diet traditionally recommended for diabetics restricts carbohydrate with little distinction made between refined and unrefined carbohydrate.

Recently this approach has been called into question by a number of studies reporting impressive results for the treatment of diabetes with fibre-supplemented or high fibre-high carbohydrate diets. The most successful treatments are associated with a flattening of the postprandial glucose and insulin curves. However the mechanism by which this occurs remains unclear^(1,2).

The present study was undertaken to gain further insight into factors affecting postprandial glucose and insulin responses to orally ingested carbohydrate in diabetics (simple versus complex carbohydrate, and the physical form of the complex carbohydrate). Six recently diagnosed maturity-onset diabetics consumed 3 test meals containing 75 g of carbohydrate: given as Glucola (G), cooked brown rice (BR) and cooked ground brown rice (GBR). Postprandial glucose and insulin responses were measured over 4 hours. Results shown are means \pm S.E.M. (n = 6).

	Glucola	Ground brown rice	Brown rice
Peak glucose (Absolute mM)	15.7 \pm 1.8	13.8 \pm 1.6	11.0 \pm 1.4
Δ Change from fasting glucose (mM)	8.6 \pm 1.2	7.3 \pm 0.8	3.6 \pm 0.9
Peak insulin (Absolute μ U/ml)	80 \pm 23.5	70 \pm 18.6	42 \pm 7.4
Δ Change from fasting insulin (μ U/ml)	66 \pm 18.3	61 \pm 14.3	27 \pm 6.4

The glucose and insulin responses to BR were significantly lower than those to G and GBR ($p < 0.05$). Therefore it appears that the distinction between simple carbohydrate and complex carbohydrate and also the physical form of the complex carbohydrate are important determinants of postprandial insulin and glucose responses to starch. The results of the present study may explain the mechanism by which diets high in unrefined carbohydrate improve diabetic control.

1. CRAPO, P.A.; REAVEN, G.; OLEFSKY, J. (1977) *Diabetes* **26** (12):1178.
2. JENKINS, D.J.A.; WOLEVER, T.M.S.; LEEDS, A.R.; GASSULL, M.A. (1978) *Br. Med. J.* **1**:1392.

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